Methods: Of 1918 PCI (1623 pts, aged 66 ± 4 years old; 65% males) performed in our catheterization laboratory from January the 1st 2011 to January the 31st 2012, the 70% (1342) were performed via radial and 576 (30%) via femoral (187 cross over from radial, 324 due to operator criteria 65 for no appropriate Sheathless shape available) and 156 PCI (142 pts) initially scheduled via femoral were rescue to radial using SGC. Reasons for SGC use were: moderate to severe radial spasm in 48, tortuosity and/or subclavian elongation in 36, proximal radial take-off in 12, insufficient backup or difficulties to coronary engage in 23 and 37 by expected mismatch between radial artery and catheter needed for PCI.
Results: A total of 164 SGC were employed (98 (60%) of 6.5 Fr), being Super Power Backup (68%) the most common used followed by Amplatz left (21%). Successful rate was 100%. 105 left and 51 right coronary were engaged with SGC. There were 5 left main and 2 right coronary ostium (4,5%) iatrogenic dissections (all resolved with stent implantation). In 13 (8.3 %) cases there was an insufficient backup due to backward slip of the catheter at radial insertion point in the wrist that led to the need of active fixation of the catheter at that point.
Conclusions: The larger inner diameter, hydrophilic coated and tractability of SGC allows performing complex transradial procedure with a high successful rate and low cross over rate. The risk of coronary ostiums dissection with SGC is not neegligible and manufacturers should consider diminishing catheter tip' stiffness. In complex procedures (chronic occlusions, rotablator, etc) active fixation at the wrist should be considered to avoid the backward slip of the catheter at the insertion point in the wrist.

TCT-409

Radial Access: Is There An Increased Risk Of Operator Radiation Exposure During A Right Versus Left Radial Approach?

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Background: The transradial approach (TRA) is widely being adopted as the preferred method of access for coronary angiography. Previous studies have demonstrated that access with the left radial approach (LRA) may have some advantages over the right radial approach (RRA) such as decreased tortuosity and better catheter support. Few studies have demonstrated a significant difference in the amount of fluoroscopy time (FT) and environmental radiation exposure, but little data exist showing direct radiation exposure to the operator when comparing these two approaches. The aim of this study is to determine weather there is a significant difference in direct radiation exposure to the operator when using a LRA versus a RRA.
Methods: A total of 60 consecutive patients were randomized to a LRA or RRA. Patients with arteriovenous fistulas, prior coronary bypass surgery, or ST-elevation myocardial infarcts were excluded. Radiation dosimeter badges (RDB) were strategically placed on the head, external thyroid and internal sternum for each operator. Individual variables, including FT, scenes, calculated radiation dose, Head RDB, External Thyroid RDB and Internal Sternum RDB, were independently compared between LRA and RRA using a two-sampled t-test.
Results: There was no significant difference in FT, scenes and calculated radiation dose between LRA and RRA. However, a comparison of the RDB reveals a significant difference in direct radiation exposure to the operators' external thyroid RDB (p=0.015) and a trend towards significance in the head RDB (p=0.070). There was no significant difference in the internal sternum RDB measurements. (Table 1)

Table 1

	LRA (n=31)	RRA (n=29)	p-value
FT (min)	13.1±8.9	11.5±8.2	0.483
Scenes	15.1 ±9	16.2 ±10	0.659
Calculated Radiation Dose (MGy)	1634 ±921	1853 ±1545	0.512
Head RDB (mRems)	12.5 ±9.3	17.7 ±12.6	0.070
External Thyroid (mRems)	19.1 ±15.0	33.0 ±26.9	0.015
Internal Sternum (mRems)	3.0 ±4.5	4.0 ±5.3	0.462

Conclusions: There is a statistically significant increased risk of operator radiation exposure seen in the external thyroid RDB, and a trend towards significance in the head RDB, during a right radial approach.

TCT-410

Arteriotomy Location Guided by Fluoroscopy Plus Real-time Ultrasound: In Defense of the Femoral Approach

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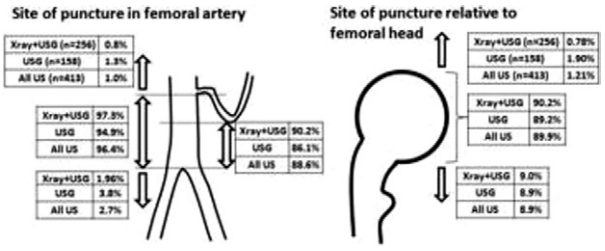
Background: Vascular complications are increased by puncture above or below the common femoral artery (CFA). The FAUST study showed that real-time ultrasound guidance (USG) modestly increased accuracy over fluoroscopic guidance (86.4% vs 83.3% CFA punctures) and decreased vascular complications. We hypothesized that USG accuracy could be improved.
Methods: 416 consecutive femoral sheath arteriograms were analyzed by a blinded reviewer. Procedures were performed with USG alone or with fluoroscopic femoral landmarks + USG (Xray+USG) by a single operator with USG experience. A micropuncture system and ultrasound probe needle guide were used. We recorded the site of arteriotomy in the femoral artery and also relative to the femoral head (FH), and the relation of the femoral bifurcation (FBi) to the FH.
Results: The puncture was in the CFA in 97.3% (Xray+USG; n=256) and 94.9% (USG; n=158; difference NS). The FBi was above the inferior border of the FH in 47.6% of studies, and above the middle of the FH in 4.1%.



Conclusions: Despite many high bifurcations, Xray+USG guidance permitted CFA puncture in 97.3% of catheterizations. The radial approach, pharmacologic improvements and other strategies have focused attention on the importance of reducing bleeding and vascular complications. Our series suggests that the Xray+USG technique may improve outcomes when the femoral approach is needed, as for large catheter interventions.

TCT-411

Use of Sheathless Guide Catheter with Transradial Percutaneous Coronary Intervention: Single Center Experience with 7853 Procedures

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Background: Sheathless guide catheter is a hydrophilic catheter without use of an introducer sheath so that it decreases stress to radial artery. Although transradial percutaneous coronary intervention (TRI) using a sheathless guide catheter (Sheathless TRI) associates potential limitations such as its procedural complexity or coronary ostial dissection due to its tip stiffness, any large number studies have not shown the data yet.
Methods: Our institution has utilized transradial approach as an initial system for more than ten years. Since we started to use sheathless TRI in 2004, with experiences and improvement of devices sheathless TRI is currently utilized in most TRIs including emergent cases, even in bifurcation or rotational atherectomy by using 7.5 Fr sheathless TRI. We retrospectively investigated the feasibility and safety of sheathless TRI, undertaken at our institution from January 2004 to December 2011.
Results: A total of 10293 PCIs was performed in this study period by 43 operators including beginners to specialists. TRI was performed in 8868 cases, consisting of 7853 cases (88.5%) of sheathless TRI and 1015 cases (11.5%) of TRI using a conventional sheath. In any cases other than chronic total occlusion procedural success, defined as successful revascularization without conversion to other guide catheter systems, was achieved in 98.9% of sheathless TRI and 98.0% of TRI using conventional sheath (p=0.018). Conversion from sheathless TRI to other system was occurred in 37 cases (0.47%) including 35 cases from sheathless TRI to TRI using conventional sheath and 2 cases from it to transfemoral approach. Coronary ostium dissection was occurred in 20 cases (0.23%) in all TRIs including 16 cases (0.20%) by sheathless TRI and 4 cases (0.39%) by TRI using conventional sheath (p=0.28), which were all bailed out by stent deployment resulting in procedural success. Critical arm ischemia requiring amputation or resulting in persistent paralysis was not seen in any cases.
Conclusions: Use of sheathless guide catheter via transradial artery is a feasible approach as an initial system for any interventionalists in any situations as long as transradial approach is permitted.

TCT-412

Diltiazem, verapamil or dinitrate isosorbid for prevention of radial artery spasm in percutaneous coronary intervention

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Background: Radial artery spasm (RAS) remains the major limitation of transradial approach for percutaneous coronary interventions (PCI). We have previously demonstrated efficacy of verapamil to reduce RAS but recently, supply problems have occurred and many cathlab have changed verapamil to another calcium channel blocker, diltiazem.

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However, only poor data are known about safety and efficacy of diltiazem in this setting. The aim of our study was to evaluate the safety and efficacy of different vasodilators in the prevention of RAS during transradial PCI.
Methods: 332 patients were consecutively randomized to blindly receive diltiazem 5 mg (n =117), verapamil 2.5 mg (n=109), or isosorbide dinitrate 1 mg (n =106) in three centers (Paris, France). All study drugs were administrated through the arterial sheath. The primary end point was the occurrence of a severe RAS defined by the operator as severe limitation of the catheter movement, with or without angiographic confirmation. Secondary endpoints included minor RAS, safety events (need for vasopressor, fluids, atropine support) and pain assessment scale.
Results: Main characteristics including age, sex, weight, height, diabetes, arterial sheath diameters, and number of coronary catheters used were identical across the three groups. The rate of severe RAS was lowest in patients receiving isosorbide dinitrate (n=4, 3.8%), and verapamil (n=6, 5.5%), compared to diltiazem (n=12, 10.3%) but the difference was not statistically significant (p=0.128). The same results were found for minor RAS, respectively 17.4%, 16.0% and 25.6% (p=0.147). There was also no significant difference in term of safety events and pain sensation between the different groups. PCI was successful for all patients and no switch to transfemoral was reported in the entire population.
Conclusions: Frequency of severe RAS tended to be higher in patients receiving diltiazem compared to verapamil and isosorbide dinitrate during transradial procedures.

TCT-413

Left and Right Heart Catheterizations Utilizing the Radial Artery and Forearm Vein: a Single Center Experience

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Background: The transradial approach for left heart catheterization has become more frequent due to lower rate of major access site complications Even if the central venous access from periferal veins is an established technique, less data are available with regard to its use in the right heart catheterization.
Methods: We analyzed data on 764 patients who underwent left and right heart catheterizations in our hospital between January 2009 and March 2012.From January 2010 all 4 operators of the Cath-Lab have chosen the radial artery as a standardized approach for left catheterization and the forearm vein for the right catheterization. Procedural information, need of access shift, vascular complications, radiological data, duration of the procedure, type and amount of contrast agent were recorded.
Results: On this population, left and right heart catheterization utilizing the radial artery and superficial forearm vein were been completed in 325 on 764 patients (45%). 302 (43%) patients underwent left and right catheterization trough the leg, 106 pts underwent left heart catheterization through the radial artery and right catheterization trough the femoral vein, 31 pts underwent left catheterization trough femoral artery and right catheterization trough forearm vein. From January 2011 the 82% of patients underwent complete cardiac catheterization trough radial artery and forearm vein. The vein shift from forearm to femoral vein occurred in 14 patients (4%) and the arterial shift from radial to femoral approach in 21 patients (6%). In the group of right heart catheterization utilizing the superficial forearm vein, complications related to the vein acces occurred in 1 patients (artero-venouse fistula); in the group of artery radial access site complications occurred in 2 patients (one artery perforation and one succlavian artery dissection): no case required surgical treatment.
Conclusions: The transradial artery and superficial forearm venous approach for bilateral cardiac catheterizations can be safe and feasible alternative to the femoral approach. This approach can improve safety and patient comfort. Learn and take confidence with this venous technique can improve the operator's r.

TCT-414

Angiographic predictive factors of vascular complications after transcatheter aortic valve implantation in patients treated with Prostar closure device

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Background: Percutaneous approach techniques with closure device after transcutaneous aortic valve implantation (TAVI), have diminished vascular complications, which nevertheless still occur. In this retrospective study we will report incidence and angiographic factors predisposing to major vascular complications, in patients undergoing TAVI using Prostar® XL closure device as a default strategy.
Methods: Consecutive patients, who underwent TAVI transfemorally using Prostar® XL, were evaluated. The incidence of vc was evaluated according to VARC criteria. Using arterial angiography, the femoral-iliac arterial tortuosity was adjusted for large arterial diameters, and expressed as the ratio Total Tortuosity/Arterial Diameter (TT/AD). Arterial calcification, the combination of angulation and atheromatosis at the puncture site, and ideal puncture, were evaluated too. In all patients, 30 days follow-up was available.
Results: Out of 112 patients treated with TAVI, in 84 patients (42 males (48.8%), 80.2±5.86 years, AVA: 0.65±0.14 cm^2) the procedure was performed transfemorally. In patients with major vascular complications (17/84 (20.23%)) comparing to those without, arterial calcification (11 pts (64.7%) vs. 8 pts (11.9%), p<0.01) and the TT/AD (30.2 ± 11.25 vs. 22.06 ± 8.64, p<0.01) were independent predictors. A correlation of the angiographic TT with the one calculated with computed tomography in 10 selected patients was verified (r=0.66, p=0.013). Additionally, ideal puncture was achieved more frequently among patients without vascular complications comparing to those with major (94.1% vs. 70.6%, p.0.01). Blood transfusions (1.48 ± 0.37 vs. 2.45 ± 0.59, p=0.023) and procedural delays (5 ±7.47 minutes vs. 22.71 ± 4.98 minutes, p<0.01) were more frequent among patients with major vascular complications (16/17). Finally, mimimum creatinine clearance after TAVI predicted all-cause 30 days mortality (p=0.021).
Conclusions: Major vascular complications after TAVI with the use of Prostar closure device can be predicted by arterial calcification at the puncture site and TT/AD ratio. Minimum creatinine clearance after TAVI, predicted 30-day mortality.

TCT-415

Transradial Catheterization is Not Associated With Increased Patient Radiation Exposure Compared to Transfemoral Access: A Meta-analysis

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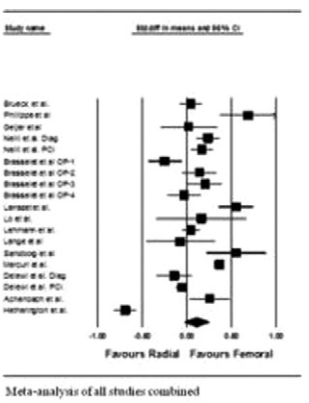
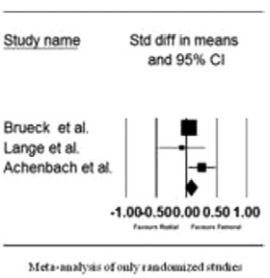
Background: We conducted a meta-analysis to determine whether transradial catheterization is associated with higher patient radiation exposure compared to transfemoral access.
Methods: Using various keywords, we conducted search at major electronic databases from 1950 to May 2012.We included original English language articles comparing transradial and transfemoral access and reporting patient radiation dose in dose area product and air kerma. Approximate means and standard deviations were obtained by assuming that data came from a Weibull distribution derived from Monte-Carlo algorithm.
Results: A total of 14 studies (3 randomized, 10 prospective, 1 retrospective) were included for analysis. A meta-analysis of all 14 studies revealed no difference in patient radiation dose between transradial and transfemoral access (standard difference in mean=0.11, 95% CI −0.04 to 0.25, p= 0.15).Analysis of the randomized studies alone also showed no difference (standard difference in mean= 0.079, 95% CI −0.025 to 0.183, p=0.14). Figure-1 shows the forest plot of combined and the randomized studies. . The heterogeneity was high (I squared= 94) with all studies combined, however the heterogeneity decreased after removal of the observational studies (I squared=37). This indicates that most of the heterogeneity came from the observational studies likely a result of biases inherent to non-randomized studies. Begg and Mazumdar's correlation test showed no indication of publication bias (two tailed p= 0.36).





Conclusions: Transradial catheterization was not associated with higher patient radiation exposure than transfemoral access.

TCT-416

Did the RIVAL Trial Increase Transradial Coronary Intervention in Patients with Acute Myocardial Infarction? Results from Korea Working Group on Myocardial Infarction Registry

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Background: The recent RIVAL trial has made substantial contributions to the world of percutaneous coronary intervention (PCI), drawing attention to access site and bleeding complications. However, it is not well known how often the transradial (TR) approach becomes used after the RIVAL trial in real world clinical practice. We aimed to